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Schrodinger's Equation and Symmetric Proximity Effect Film Sandwiches[1] BENJAMIN LUKE, PHILLIP BROUSSARD, Covenant College — This study sought to use Schrödigner's equation to model superconducting proximity effect systems of symmetric forms. As N. R. Werthamer noted, [Phys. Rev. **132** (6), 2441 (1963)] one to one analogies between the standard superconducting proximity effect equation and the one-dimensional, time-independent Schrödinger's equation can be made, thus allowing one to model the behavior of proximity effect systems of metallic film sandwiches by solving Schrödinger's equation. In this project, film systems were modeled by infinite square wells with simple potentials. Schrödinger's equation was solved for sandwiches of the form $S(NS)_M$ and $N(SN)_M$, where S and N represent superconducting and nonsuperconducting metal films, respectively, and M is the number of repeated bilayers, or the period. A comparison of Neumann and Dirichlet boundary conditions was done in order to explore their effects. The Dirichlet type produced eigenvalues for $S(NS)_M$ and $N(SN)_M$ sandwiches that converged for increasing M, but the Neumann type produced eigenvalues for the same structures that approached two different limits as M increased. Although unexpected, this implies a dependence upon the type of film end layer.

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Benjamin Luke
Covenant College

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